

DETAILED ACTION

1. This office action is in response to RCE filed 2/25/11. Claims 1, 3-6, 15-17, 19-28 and 31 and 32 are pending in the application and rejected as set forth below.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 3-6 and 19-23 rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-264846A in view of JP2003-146252A.

Re Claim 1, JP 2002-264846A discloses an FRP panel for an automobile comprising a panel portion (1, 11, 31, 41, 51, 61, 71) having a first FRP layer (13) on a first surface side and a second FRP layer (14) on a second surface side on an opposite side of the first surface (See figures) wherein either of the first and second FRP layers is formed as lower strength FRP layer, and the lower strength FRP layer forms a crushable structure that absorbs impact to a pedestrian during a collision. Re Claim 3, JP 2002-264846A discloses wherein said panel element (11) is a panel element which has a space (12) between said first FRP layer (13) and said second FRP layer (14). Re Claim 4, JP 2002-264846A discloses a core material is disposed in said space (12). Re Claim 23, JP 2002-264846A discloses a difference in planar rigidity against external force is provided between said first and second FRP layers by providing a difference in hardness between a surface and a back surface of said core material (see Paragraphs [0009] and [0020]). Re Claim 5, JP 2002-264846A discloses a plurality of panel elements (13, 14) are provided, and a space is formed between adjacent panel elements (See Figures). Re Claim 6, JP 2002-264846A discloses a core material is disposed in said space (12).

JP 2002-264846A fails to disclose wherein said difference in rigidity or differences in strength or both are provided by one or two or more differences selected from the group consisting of a difference in amount of reinforcing fibers, a difference in property of reinforcing fibers and a difference in orientation of reinforcing fibers wherein said panel portion is an FRP solid plate formed integrally with said first FRP layer and said second FRP layer and said difference in strength is provided by providing a high breaking elongation layer on the lower strength FRP layer.

JP2003-146252A teaches a difference in rigidity or differences in strength or both are provided by one or two or more differences selected from the group consisting of a difference in amount of reinforcing fibers, a difference in property of reinforcing fibers and a difference in orientation of reinforcing fibers wherein said panel portion is an FRP solid plate formed integrally with said first FRP layer and said second FRP layer and said difference in strength is provided by providing a high breaking elongation layer (5).

It would have been obvious to one with ordinary skill in the art at the time the invention was made to use a different fiber with a different rigidity as taught by JP2003-146252A on the device JP2002-264846A in order to change the strength of the panel when and prevent fracturing of the panel when in a collision.

As for the difference in strength is provided by providing a high breaking elongation layer on the lower strength FRP layer, it would have been obvious to one with ordinary skill in the art at the time the invention was made to switch and relocate the layers in order to obtain the best results and requires little to no routine skill in the art. It has been held that rearranging parts in an invention requires only routine skill in the art. *In re Japikse*, 86 USPQ 70

JP2002-264846A further fails to disclose wherein said difference in rigidity is provided by a condition where, with respect to a running direction of said automobile, a main orientation direction of reinforcing fibers of said first FRP layer is in a range of $\pm 20^\circ$ relative to $\pm 45^\circ$ disposition, and a main orientation direction of reinforcing fibers of said second FRP layer is in a range of $\pm 20^\circ$ relative to $0^\circ/90^\circ$ disposition. JP 2002-264846A further fails to disclose said difference in strength is provided by providing a high breaking elongation layer into any one of said first and second FRP layers; said high breaking elongation layer comprises a high breaking elongation resin, and said high breaking elongation resin comprises a thermoplastic resin having a low affinity in adhesion with a matrix resin of said FRP layer; high breaking elongation layer comprises a thermoplastic resin film, a multi-layer laminated film; wherein said difference in rigidity and/or said difference in strength is provided by providing a difference in thickness between said first and second FRP layers.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to change the difference in rigidity or strength by changing the orientation of the fibers and/or putting more fibers in one panel over the other, for it is commonly known in the art of working with carbon fiber. The layers are usually laminated together and the fibers are laid at different angles. As for the breaking elongation, it would have been obvious to one with ordinary skill in the art at the time the invention was made to for thermoplastic resins are well known in the art and changing the composition of them to strengthen or weaken them is well known in the art also, as for the material being laminated, it is common to laminate carbon fiber

Art Unit: 3612

to strengthen the material. Furthermore these are mere design choices and require little to no skill in the art.

4. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-264846A as modified by JP2003-146252A in view of US Pat # 7,150,496 to Fujimoto.

JP 2002-264846A as modified fails to disclose a panel plane is sectioned in a lattice-like form into nearly rectangular areas by said concave/convex shape into nearly diamond-shaped areas by said concave/convex shape, and wherein said concave/convex shape is provided so as to depict a multiple closed curved line with a nearly concentric analog formation on a panel plane, wherein said concave/convex shape is provided along an outer circumferential shape of said FRP panel for an automobile, wherein said difference in strength is provided by introducing a plurality of discontinuous part of a reinforcing fiber substrate into at least one reinforcing fiber substrate layer of any one of said first and second FRP layers, wherein the discontinuous part extends almost straightly.

Fujimoto teaches the use a panel plane is sectioned in a lattice-like form into nearly rectangular areas by said concave/convex shape into nearly diamond-shaped areas by said concave/convex shape, and wherein said concave/convex shape is provided so as to depict a multiple closed curved line with a nearly concentric analog formation on a panel plane, wherein said concave/convex shape is provided along an outer circumferential shape of said FRP panel for an automobile, wherein said difference in strength is provided by introducing a plurality of discontinuous part of a reinforcing fiber substrate into at least one reinforcing fiber substrate layer of any one of said first and second FRP layers, wherein the discontinuous part extends almost straightly (See Figures 1-10).

Art Unit: 3612

It would have been obvious to one with ordinary skill in the art at the time the invention was made to change the shape of the panel plane as taught by Fujimoto on the device of JP 2002-264846A in order to change the energy absorption of the panel during impact, furthermore changing the shape and/or size of an object is considered to be a design choice.

5. Claims 24-28, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-264846A in view of JP2003-311856 A.

Re Claims 24-28 and 32 JP 2002-264846 A discloses An FRP panel for an automobile comprising a panel portion having a first FRP layer on a first surface side and a second FRP layer on a second surface side on an opposite side of the first surface, wherein either of the first and second FRP layers is formed as a lower-strength FRP layer, and the lower-strength FRP layer forms a crushable structure that absorbs impacts to a pedestrian during a collision, wherein differences in strength are provided by one or two or more differences selected from the group consisting of a difference in amount of reinforcing fibers, a difference in property of reinforcing fibers and a difference in orientation of reinforcing fibers, wherein said panel portion is an FRP solid plate formed integrally with said first FRP layer and said second FRP layer, wherein said panel portion is a panel element which has a space between said first FRP layer and said second FRP layer, wherein a core material is disposed in said space, wherein a plurality of panel portions are provided, and a space is formed between adjacent panel portions (please see above rejection).

JP 2002-264846 A fails to disclose said difference in strength is provided by introducing a discontinuous part of a reinforcing fiber substrate, which is a trigger point for breakage, on at least one reinforcing fiber substrate layer of the lower strength FRP layer, wherein a difference in

Art Unit: 3612

planar rigidity against external force is provided between said first and second FRP layers by providing a difference in hardness between a surface and a back surface of said core material..

JP2003-311856 A teaches said difference in strength is provided by introducing a discontinuous part (2a and b) of a reinforcing fiber substrate, which is a trigger point for breakage, into at least one reinforcing fiber substrate layer of any one of said first and second FRP layers, wherein a difference in planar rigidity against external force is provided between said first and second FRP layers by providing a difference in hardness between a surface and a back surface of said core material (for it has the discontinuous part which changes the hardness of the panel).

As for the on at least one reinforcing fiber substrate layer of the lower strength FRP layer, it would have been obvious to one with ordinary skill in the art at the time the invention was made to switch and relocate the layers in order to obtain the best results and requires little to no routine skill in the art, and therefore would be obvious over the cited art. It has been held that rearranging parts in an invention requires only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Re Claim 31 JP 2002-264846 A as modified by JP2003-311856 A fails to disclose the wherein the difference wherein said difference in strength is provided by providing a difference in thickness between said first and second FRP layers, but it would have been obvious to one with ordinary skill in the art at the time the invention was made that the layer could have been different thicknesses since JP 2002-264846 A disclose that the layers may be made of more than one layer, furthermore it is known in the art to change the strength of by making it thicker or thinner.

Response to Arguments

Art Unit: 3612

6. Applicant's arguments with respect to claims 1 and 24 have been considered but are not persuasive. Please see above rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELISSA A. BLACK whose telephone number is (571)272-4737. The examiner can normally be reached on M-F 7:00-3:30 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Dayoan can be reached on (571) 272-6659. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. A. B./
Examiner, Art Unit 3612

/GLENN DAYOAN/
Supervisory Patent Examiner, Art Unit 3612